

Itasca Grid Format

This is for the grid file format description.

A *FLAC3D* ASCII-format grid file has the following specifications: comment lines start with an asterisk; blank lines are ignored; and comma separators between numeric values are optional.

A line starting with “G” indicates a gridpoint definition. A gridpoint contains an integer identifier (ID number) followed by the x, y, z coordinates of the gridpoint (floating point numbers).

A line starting with “Z” indicates a zone definition. A zone contains a zone type identifier, an integer zone identifier and the identifiers of the gridpoints comprising this zone.

The ID numbers for the gridpoints and zones must be positive integers. The ID numbers do not have to be sequential or consecutive (gaps are allowed in the numbering); however, every gridpoint ID referred to by a zone must exist in the gridpoint list somewhere. If the `use-given-ids` keyword is given, the ID numbers of gridpoints and zones specified in the *.f3grid file are used in the final grid. Otherwise, gridpoints and zones are generated using the next available ID numbers (the default). Also, the `use-given-ids` keyword allows grids to be imported in a piecemeal fashion. For example, if you have the following grid files:

g1.f3grid – gridpoint definitions

g2.f3grid – more gridpoint definitions

g3.f3grid – more gridpoint definitions

z13.f3grid – zone definitions using gridpoint IDs from g1 and g3

z12.f3grid – zone definitions using gridpoint IDs from g1 and g2

groups.f3grid – groups into which zones fall

they can be imported as follows:

```
zone import 'g1.f3grid' use-given-ids
zone import 'g3.f3grid' use-given-ids
zone import 'z13.f3grid' use-given-ids
zone import 'g2.f3grid' use-given-ids
zone import 'z12.f3grid' use-given-ids
zone import 'groups.f3grid' use-given-ids
```

For this to work, the only requirement is that gridpoints must exist prior to creating the zones that require them. Also, zones must exist prior to placing them in groups.

The following zone type identifiers are recognized:

B8 – brick type zone

W6 – wedge type zone

P5 – pyramid type zone

B7 – degenerate brick type zone

T4 – tetrahedral type zone

For the zone definition, the gridpoint ID numbers must be specified in the standard *FLAC3D* ordering (see [Orientation of Nodes and Faces within a Zone](#)). The redundant points for wedge, pyramid, degenerate brick and tetrahedral zones are not specified in the grid file. For a B8 zone, 8 gridpoints must be specified, for a W6 zone, 6 gridpoints must be specified, etc.

A line starting with “ZGROUP” indicates a group definition for zones. The text immediately following the word ZGROUP is the name of the group. Following the group name, all zones belonging to this group are specified with zone ID numbers. A line starting with “F” indicates a face definition. A face line contains a type identifier (a unique identifier for the face) and a set of gridpoint IDs that form a face in a zone. Type face identifiers are defined as “T3” for tetrahedral zone faces and “Q4” for quadrilateral zone faces.

A line starting with “FGROUP” indicates a group of faces. Face groups are used in the range logic, allowing the user to apply properties, boundary conditions, velocities, etc. to a set of faces. The face group line contains the face group name. Lines containing the identifiers of the previously defined faces will follow the FGROUP line. The face identifiers are separated by spaces. This will assign the group name to all faces in the line when the grid is created.

The code block below shows a portion of a *FLAC3D* grid file:

```
*FLAC3D input deck produced by KUBRIX version 7.1.0
*mesh built: Wed Nov 19 20:54:43 2003
*GRIDPOINTS
G 1, -6.133336e+000, -6.144340e+000, -3.999275e+001
G 2, -4.732805e+000, -7.033142e+000, -3.999276e+001
G 3, -2.777756e+000, -4.116792e+000, -3.999988e+001
G 4, -3.535428e+000, -3.535424e+000, -3.999989e+001
G 457, -2.745877e+000, -4.129570e+000, -3.201193e+001
.
.
.
G 6, -3.512750e+000, -3.501916e+000, -3.200895e+001
G 17, -8.901190e+000, -8.922812e+000, -3.999268e+001
G 8, -6.845476e+000, -1.015358e+001, -3.999268e+001
*ZONES
Z B8 1, 1, 2, 4, 1443, 3, 6, 1444, 5
Z B8 2, 7, 8, 1, 1445, 2, 1443, 1446, 1444
Z B8 3, 9, 10, 7, 1447, 8, 1445, 1448, 1446
Z B8 4, 11, 12, 9, 1449, 10, 1447, 1450, 1448
.
.
.
Z B8 2785, 13, 14, 11, 1451, 12, 1449, 1452, 1450
Z B8 62, 15, 16, 13, 1453, 14, 1451, 1454, 1452
Z B8 78, 17, 18, 15, 1455, 16, 1453, 1456, 1454
*GROUPS
ZGROUP 'granite type 1'
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45
ZGROUP 'ore zone'
1601 1602 1603 1604 1605 1606 1607 1608
```